Stanford South Pole VLF Beacon Transmission Format

The transmission format consists of a one-minute constant-power pulse at a frequency of 19.400 kHz, sent four times per hour starting at 06, 21, 36, and 51 minutes past the UTC hour. During the first two seconds of each pulse, the Morse code call sign “NPX” is sent using frequency shift keying between 19.400 and 19.500 kHz. During the remaining 58 seconds of each pulse, a continuous-wave signal is transmitted, briefly interrupted at the middle of each second by a 60-ms long MSK pulse for group delay measurements.

The timing and frequency of each transmission is synchronized to a GPS clock with an estimated error of 100 ns at each zero crossing. The phase of the 19.4 kHz signal component is continuous throughout the transmission, enabling long integration times at the receiver.